

## CLAIMS

What is claimed is:

1. In a computer system, a method of implementing message dispatch for an object-oriented program, comprising:
  - collecting receiver type information at a site of a method that dispatches messages to receiver objects; and
  - saving the receiver type information for a subsequent execution of the program.
- 10 2. The method of claim 1, wherein the receiver type information includes each different receiver type to which messages were dispatched from the site.
- 15 3. The method of claim 1, wherein the receiver type information includes references to call sites for each different receiver type to which messages were dispatched from the site.
4. The method of claim 1, wherein the receiver type information includes receiver types encountered at call sites of inlined methods.
- 20 5. The method of claim 1, wherein the receiver type information is collected while the program is being interpreted.
- 25 6. The method of claim 5, further comprising determining that it would be desirable to compile the method that includes the site that dispatches messages to receiver objects.
- 30 7. The method of claim 6, wherein determining that it would be desirable to compile a method includes determining that the method has been invoked more than a predetermined number of times.
8. The method of claim 7, further comprising compiling the method to include the receiver type information at the site that dispatches messages to receiver objects.
- 35 9. The method of claim 8, wherein the compiled method continues to collect receiver type information.

10. The method of claim 1, wherein the receiver type information is collected in a polymorphic inline cache.
- 5 11. The method of claim 1, wherein the receiver type information is saved in a class file for the method.
- 10 12. The method of claim 11, wherein the receiver type information is saved in an attributes section of the class file.
- 15 13. A computer program product that implements message dispatch for an object-oriented program, comprising:
  - computer code that collects receiver type information at a site of a method that dispatches messages to receiver objects; and
  - computer code that saves the receiver type information for a subsequent execution of the program; and
  - a computer readable medium that stores the computer code.
- 20 14. A computer system that implements message dispatch for an object-oriented program, comprising:
  - a processor that executes computer code;
  - computer code that collects receiver type information at a site of a method that dispatches messages to receiver objects; and
  - computer code that saves the receiver type information for a subsequent execution of the program; and
  - a computer readable medium that stores the computer code for the processor to execute.
- 30 15. In a computer system, a method of implementing message dispatch for an object-oriented program, comprising:
  - during interpretation, collecting receiver type information at a site of a method that dispatches messages to receiver objects, wherein the receiver type information includes each different receiver type and a reference to the site for each different receiver type to which messages were dispatched from the site;
  - 35 determining that it would be desirable to compile the method that includes the site that dispatches messages to receiver objects;
  - compiling the method to include the receiver type information at the site that dispatches messages to receiver objects; and
  - saving the receiver type information for a subsequent execution of the program.

16. The method of claim 15, wherein the receiver type information includes receiver types encountered at call sites of inlined methods.

5 17. The method of claim 15, wherein determining that it would be desirable to compile a method includes determining that the method has been invoked more than a predetermined number of times.

10 18. The method of claim 15, wherein the compiled method continues to collect receiver type information.

19. The method of claim 15, wherein the receiver type information is collected in a polymorphic inline cache.

15 20. The method of claim 15, wherein the receiver type information is saved in a Java class file for the method.

20 21. The method of claim 20, wherein the receiver type information is saved in an attributes section of the Java class file.

22. A computer program product that implements message dispatch for an object-oriented program, comprising:

computer code that during interpretation, collects receiver type information at a site of a method that dispatches messages to receiver objects, wherein the receiver type information includes each different receiver type and a reference to the site for each different receiver type to which messages were dispatched from the site;

computer code that determines that it would be desirable to compile the method that includes the site that dispatches messages to receiver objects;

computer code that compiles the method to include the receiver type information at the site that dispatches messages to receiver objects; and

computer code that saves the receiver type information for a subsequent execution of the program; and

a computer readable medium that stores the computer code.

35 23. A computer system that implements message dispatch for an object-oriented program, comprising:

a processor that executes computer code;

computer code that during interpretation, collects receiver type information at a site of a method that dispatches messages to receiver objects, wherein the receiver type

information includes each different receiver type and a reference to the site for each different receiver type to which messages were dispatched from the site;

computer code that determines that it would be desirable to compile the method that includes the site that dispatches messages to receiver objects;

5 computer code that compiles the method to include the receiver type information at the site that dispatches messages to receiver objects; and

computer code that saves the receiver type information for a subsequent execution of the program; and

10 a computer readable medium that stores the computer code for the processor to execute.

24. A data structure stored by a computer readable medium for an object-oriented method, comprising:

at least one receiver type stored by the computer readable medium; and

15 nested receiver types by the computer readable medium, the nested receiver types being of receiver types that were dispatched messages at message dispatch sites in the method.

25. The data structure of claim 24, wherein the nested receiver types include 20 references to message dispatch sites in the method.

26. The data structure of claim 24, wherein the nested receiver types include receiver types that were dispatched messages at message dispatch sites in inlined methods.

25 27. The data structure of claim 24, wherein the data structure is saved in a Java class file for the method.

28. The data structure of claim 27, wherein the data structure is saved in an attributes section of the Java class file.

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